

Selective One-Way Wrench

Field of Invention

The present invention relates to a selective one-way wrench.

Background of Invention

Referring to Figure 8, a conventional selective one-way wrench 80 includes a handle 92, an annular head 81, an annular gear 86, a direction controller 87 and a direction switch 90. An annular head 81 is formed at an end of the handle 92. The annular head 81 defines a first space 82, a second space 83 communicated with the first space 82, a third space 89 communicated with the second space 83 and a recess 84 communicated with the third space 89. The annular gear 86 is rotationally put in the first space 82. The annular gear 86 includes a toothed external face 99 formed thereon. The direction controller 87 is put in the second space 83. The direction controller 87 includes two pawls 94 and 95 and a spring 88 installed between the pawls 94 and 95. The pawl 94 includes a toothed face 96 formed thereon. The pawl 95 includes a toothed face 97 formed thereon. The direction switch 90 is rotationally installed in the recess 84 of the handle 92 and partially put in the third space 89 for bringing the toothed face 96 of the pawls 94 or the toothed face 97 of the pawl 95 into engagement with the toothed external face 99 of the annular gear 86.

Summary of Invention

The primary objective of the present invention is to provide a selective

1 one-way wrench.

2

3 In a selective one-way wrench, a handle projects from an annular head.

4 The annular head defines a first space and a second space communicated

5 with the first space. A gear is rotationally put in the first space and

6 includes a toothed external face. A direction controller is put in the

7 second space and includes two pawls and a spring installed between the

8 pawls each including a rod formed thereon and a toothed face. A driver

9 is put rotationally in the second space and includes two fingers selective

10 one of which contacts the rod of selective one of the pawls so as to bring

11 the toothed face of the selected pawl into engagement with the toothed

12 external face of the gear. A direction switch is installed rotationally on

13 the annular head and operably connected with the driver.

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15 Other objects, advantages, and novel features of the invention will

16 become more apparent from the following detailed description when

17 taken in conjunction with the attached drawings.

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19 **Brief Description of Drawings**

20 The present invention will be described through detailed illustration of

21 embodiments referring to the attached drawings.

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23 Figure 1 is a perspective view of a selective one-way wrench according to

24 a first embodiment of the present invention.

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26 Figure 2 is an exploded view of the selective one-way wrench shown in

1 Figure 1.

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3 Figure 3 is a cross-sectional view taken along a line 3-3 of Figure 1.

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5 Figure 4 is a cross-sectional view taken along a line 4-4 of Figure 3.

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7 Figure 5 is a cross-sectional view taken along a line 5-5 of Figure 3.

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9 Figure 6 is an exploded view of the selective one-way wrench according
10 to a second embodiment of the present invention.

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12 Figure 7 is a cross-sectional view of the selective one-way wrench of
13 Figure 6.

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15 Figure 8 is an exploded view of a conventional selective one-way wrench.

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17 **Detailed Description of Embodiments**

18 Referring to Figure 1, according to a first embodiment of the present
19 invention, a selective one-way wrench 10 includes a handle 23 and an
20 annular head 11 from which the handle 23 projects.

21

22 Referring to Figure 2, the annular head 11 includes a lower portion 19
23 and an upper portion 17. The annular head 11 includes a circular space
24 12 defined in the lower portion 19 and a crescent space 13 defined in the
25 lower portion 19 and communicated with the circular space 12. An
26 annular groove 15 is defined in the wall of the circular space 12. The

1 upper portion 17 of the annular head 11 defines an aperture 18
2 communicated with the circular space 12 and a countersink hole 14
3 communicated with the crescent space 13. An annular groove 16 is
4 defined in a wall of the countersink hole 14.

5

6 A direction controller 30 is put in the crescent space 13. The direction
7 controller 30 includes two pawls 31 and 35 and a spring 32 for
8 connecting the pawl 31 with the pawl 35.

9

10 The pawl 31 includes a top, a bottom, a planar side, a toothed side 34, an
11 arched side, a hole 38 defined in the planar side and a rod 33 formed on
12 the top.

13

14 The pawl 35 includes a top, a bottom, a planar side, a toothed side 36, an
15 arched side, a hole 39 defined in the planar side and a rod 37 formed on
16 the top.

17

18 The spring 32 includes an end fit in the hole 38 and opposite end fit in the
19 hole 39. Thus, the pawl 31 is firmly connected with the pawl 35 by
20 means of the spring 32.

21

22 The driver 20 is put in the crescent space 13. The driver 20 includes a
23 recess 21 defined therein and two fingers 24 and 26 both extending from
24 a side.

25

26 The direction switch 50 is put in the countersink hole 14. The direction

1 switch 50 includes a disc 51 and a lever 52 extending from the disc 51.
2 An annular groove 53 is in the periphery of the disc 51. The direction
3 switch 50 further includes a shaft 54 extending from the disc 51 and a
4 ridge 55 extending from the shaft 54.

5
6 A C-ring 56 includes an internal edge put in the annular groove 53. The
7 ridge 55 is inserted into the recess 21 through the countersink hole 14.
8 The direction switch 50 can drive the driver 20 so that the finger 24 or 26
9 is engaged with the rod 33 or 37. The C-ring 56 includes an external
10 edge put in the annular groove 16. Thus, the direction switch 50 is
11 firmly attached to the annular head 11 by means of the C-ring 56.

12
13 The joint 40 is put in the circular space 12. The joint 40 includes a disc
14 41 and a square insert 42 extending from the disc 41. The disc 41
15 includes a toothed periphery 45. The square insert 42 is used for
16 insertion into a square hole defined in a socket (not shown). The square
17 insert 42 includes a hole 47 defined therein. The joint 40 includes a
18 space 49 defined in both of the disc 41 and the square insert 42 and a hole
19 47 defined in the square insert 42 and communicated with the space 49.
20 The space 49 includes an upper section and a narrow lower section, thus
21 forming an annual shoulder 78 (shown in Figure 3) between the sections
22 thereof.

23
24 An O-ring 60 is put in the circular space 12. The O-ring 60 includes an
25 annular groove 61 defined in an external face thereof.

26

1 A C-ring 62 includes an internal edge put in the annular groove 61 and an
2 external edge put in the annular groove 15. Thus, the O-ring 60 is
3 firmly attached to the annular head 11 by means of the C-ring 62. The
4 joint 40 is put in the O-ring 60 rotationally.

5
6 The control device 70 includes a rod 72 and a spring 71. The spring 71
7 is put in the space 49. The rod includes a hole 74 defined therein and an
8 inclined face 73 extending from the rod 72. The rod 72 includes an
9 upper section and a narrow lower section, thus forming an annual
10 shoulder 76 (shown in Figure 3) between the sections thereof. The rod
11 72 is inserted into the space 49. The spring 71 is compressed between
12 the annular shoulders 76 and 78. Thus, the rod 72 is biased upward by
13 means of the spring 71. A portion of a ball detent 43 is trapped in the
14 hole 47. The remaining portion of the ball detent 43 is caused to extend
15 from the hole 74 by means of the inclined face 73 of the rod 72.
16 Therefore, the ball detent 43 can retain the socket to the square insert 45.

17
18 When a user pushes down the rod 72, the ball detent 43 is inserted into
19 the hole 74, i.e., the ball detent 43 is completely concealed in the hole 74.
20 Thus, the square insert 42 can be inserted into a square hole defined in a
21 socket.

22
23 Referring to Figures 3 to 5, the direction switch 50 is in a neutral position.

24
25 Although not shown, the direction switch 50 can be moved to a first
26 position. The finger 24 pushes the rod 33. Thus, the pawl 35 is moved

1 into a right-hand end of the crescent space 13. Thus, the annular head 11
2 can drive the joint 40 counterclockwise, but not vice versa.

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4 On the contrary, the direction switch 50 can be moved to a second
5 position. The finger 24 pushes the rod 37. Thus, the pawl 31 is moved
6 into a left-hand end of the crescent space 13. Thus, the annular head 11
7 can drive the joint 40 clockwise, but not vice versa.

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9 Figures 6 and 7 show a selective one-way wrench according to a second
10 embodiment of the present invention. The second embodiment is
11 identical to the first embodiment except for replacing the joint 40 with the
12 annular gear 44 and the control device 70 is deleted. The annular gear
13 44 includes a toothed internal face 46 for engagement with a bolt or nut.

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15 The present invention has been described through detailed illustration of
16 two embodiments. Those skilled in the art can derive variation from the
17 embodiments without departing from the scope of the present invention.
18 Therefore, the embodiments shall not limit the scope of the present
19 invention defined in the claims.

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